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## Chemistry &amp; Biology

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[Research Paper]

Hogyu Han, Paul H Weinreb, Peter T Lansbury, Jr  
*Chemistry & Biology* 1995, **2**:163-169.**Abstract:****Background**

NAC is a 35-amino-acid peptide which has been isolated from the insoluble core of Alzheimer's disease (AD) amyloid plaque. It is a fragment of  $\alpha$ -synuclein (or NACP), a neuronal protein of unknown function. We noted a striking sequence similarity between NAC, the carboxyl terminus of the  $\beta$ -amyloid protein, and a region of the scrapie prion protein (PrP) which has been implicated in amyloid formation.

**Results**

NAC was prepared by chemical synthesis and was found to form amyloid fibrils via a nucleation-dependent polymerization mechanism. NAC amyloid fibrils effectively seed  $\beta$ <sub>1-40</sub> amyloid formation. Amyloid fibrils comprising peptide models of the homologous  $\beta$  and PrP sequences were also found to seed amyloid formation by NAC.

**Conclusion**

The *in vitro* model studies presented here suggest that seeding of NAC amyloid formation by the  $\beta$ -amyloid protein, or seeding of amyloid fibrils of the  $\beta$ -amyloid protein by NAC, may occur *in vivo*. Accumulation of ordered NAC aggregates in the synapse may be responsible for the neurodegeneration observed in AD and the prion disorders. Alternatively, neurodegeneration may be caused by the loss of  $\alpha$ -synuclein (NACP) function.

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